I claim:

1. A fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part and a small diameter part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either an inner surface of the end plate or a surface of one edge of the stepped shaft; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, and the third dynamic pressure groove.

2. The fluid dynamic bearing mechanism of claim 1 further comprising:

an annular groove formed in the cylindrical hole;

a circular groove formed on the stepped shaft; and

an annular ring straddling the annular groove and the circular groove to prevent the stepped shaft from slipping out of the cylindrical hole.

3. The fluid dynamic bearing mechanism of claim 2 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

4. A fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and a first step portion formed at the junction of the large diameter part and the small diameter part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part and a second step portion formed at the junction of the large diameter part and the small diameter part;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first step portion or the second step portion; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, and the third dynamic pressure groove.

5. The fluid dynamic bearing mechanism of claim 4 further comprising:

an annular groove formed in the cylindrical hole;

a circular groove formed on the stepped shaft; and

an annular ring straddling the annular groove and the circular groove to prevent the stepped shaft from slipping out of the cylindrical hole.

6. The fluid dynamic bearing mechanism of claim 5 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

7. A fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and a first tapered part connecting the large diameter part and the small diameter part of the cylindrical hole;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part, a small diameter part and a second tapered part connecting the large diameter part and the small diameter part of the stepped shaft;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first tapered part or the second part; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, and the third dynamic pressure groove.

8. The fluid dynamic bearing mechanism of claim 7 further comprising:

an annular groove formed in the cylindrical hole;

a circular groove formed on the stepped shaft; and

an annular ring straddling the annular groove and the circular groove to prevent the stepped shaft from slipping out of the cylindrical hole.

9. The fluid dynamic bearing mechanism of claim 8 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

10. A fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and an expanded diameter part, the expanded diameter part having a step part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part;

a thrust ring fit on the stepped shaft, the thrust ring being received into the expanded diameter part;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either an inner surface of the end plate or a bottom surface of the thrust ring;

a fourth dynamic pressure groove formed on either the step part or the top surface of the thrust ring facing the step part; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, the third dynamic pressure groove and the fourth dynamic pressure groove.

11. The fluid dynamic bearing mechanism of claim 10 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

12. A fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and an expanded diameter part on one end of the cylindrical hole, a first step part being formed at the junction of the large diameter part and the small diameter part of the cylindrical hole and a second step part being formed at the junction of the small diameter part and the expanded diameter of the cylindrical hole;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part, a small diameter part and a third step part at the junction of the large diameter part and the small diameter part of the stepped shaft;

a thrust ring fit on the stepped shaft, the thrust ring being received into the expanded diameter part on the cylindrical hole;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first step part or the third step part;

a fourth dynamic pressure groove formed on either the second step part or a top surface of the thrust ring; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, the third dynamic pressure groove and the fourth dynamic pressure groove.

13. The fluid dynamic bearing mechanism of claim 12 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

14. A fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and an expanded diameter part, the expanded diameter part having a step part and the large diameter part and the small diameter part of the cylindrical hole being connected by a first tapered part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part;

a second tapered part connecting the large diameter part and the small diameter part of the stepped shaft;

a thrust ring fit on the stepped shaft, the thrust ring being received into the expanded diameter part on the cylindrical hole;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first tapered part or the second tapered part;

a fourth dynamic pressure groove formed on either the step part leading to the expanded section of the cylindrical hole or a top surface of the thrust ring; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, the third dynamic pressure groove and the fourth dynamic pressure groove.

15. The fluid dynamic bearing mechanism of claim 14 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

16. A hard disk drive comprising:

a motor having a rotor mounted on a shaft; and

a disk mounted on the rotor, wherein the shaft is supported in a fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part and a small diameter part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either an inner surface of the end plate or a surface of one edge of the stepped shaft; and

lubricating oil filled in small gaps formed between facing surfaces adjacent

to the first dynamic pressure groove, the second dynamic pressure groove, and the third dynamic pressure groove.

17. The hard disk drive of claim 16 further comprising:

an annular groove formed in the cylindrical hole;

a circular groove formed on the stepped shaft; and

an annular ring straddling the annular groove and the circular groove to prevent the stepped shaft from slipping out of the cylindrical hole.

18. The hard disk drive of claim 17 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

19. A hard disk drive comprising:

a motor having a rotor mounted on a shaft; and

a disk mounted on the rotor, wherein the shaft is supported in a fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and a first step portion formed at the junction of the large diameter part and the small diameter part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part and a second step portion formed at the junction of the large diameter part and the small diameter part;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first step portion or the second step portion; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, and the third dynamic pressure groove.

20. The hard disk drive of claim 19 further comprising:

an annular groove formed in the cylindrical hole;

a circular groove formed on the stepped shaft; and

an annular ring straddling the annular groove and the circular groove to prevent the stepped shaft from slipping out of the cylindrical hole.

21. The hard disk drive of claim 20 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

22. A hard disk drive comprising:

a motor having a rotor mounted on a shaft; and

a disk mounted on the rotor, wherein the shaft is supported in a fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and a first tapered part connecting the large diameter part and the small diameter part of the cylindrical hole;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part, a small diameter part and a second tapered part connecting the large diameter part and the small diameter part of the stepped shaft;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first tapered part or the second part; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, and the third dynamic pressure groove.

23. The hard disk drive of claim 22 further comprising:

an annular groove formed in the cylindrical hole;

a circular groove formed on the stepped shaft; and

an annular ring straddling the annular groove and the circular groove to prevent the stepped shaft from slipping out of the cylindrical hole.

24. The hard disk drive of claim 23 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

25. A hard disk drive comprising:

a motor having a rotor mounted on a shaft; and

a disk mounted on the rotor, wherein the shaft is supported in a fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and an expanded diameter part, the expanded diameter part having a step part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part;

a thrust ring fit on the stepped shaft, the thrust ring being received into the expanded diameter part;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either an inner surface of the end plate or a bottom surface of the thrust ring;

a fourth dynamic pressure groove formed on either the step part or the top surface of the thrust ring facing the step part; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, the third dynamic pressure groove and the fourth dynamic pressure groove.

26. The hard disk drive of claim 25 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

27. A hard disk drive comprising:

a motor having a rotor mounted on a shaft; and

a disk mounted on the rotor, wherein the shaft is supported in a fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and an expanded diameter part on one end of the cylindrical hole, a first step part being formed at the junction of the large diameter part and the small diameter part of the cylindrical hole and a second step part being formed at the junction of the small diameter part and the expanded diameter of the cylindrical hole;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part, a small diameter part and a third step part at the junction of the large diameter part and the small diameter part of the stepped shaft;

a thrust ring fit on the stepped shaft, the thrust ring being received into the expanded diameter part on the cylindrical hole;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first step part or the third step part;

a fourth dynamic pressure groove formed on either the second step part or a top surface of the thrust ring; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, the third dynamic pressure groove and the fourth dynamic pressure groove.

28. The hard disk drive of claim 27 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.

29. A hard disk drive comprising:

a motor having a rotor mounted on a shaft; and

a disk mounted on the rotor, wherein the shaft is supported in a fluid dynamic bearing mechanism comprising:

a cylindrical bearing case;

a stepped cylindrical hole formed in the bearing case, the cylindrical hole having a large diameter part, a small diameter part and an expanded diameter part, the expanded diameter part having a step part and the large diameter part and the small diameter part of the cylindrical hole being connected by a first tapered part;

an end plate that seals one end of the bearing case to form a bearing housing;

a stepped shaft inserted in the bearing housing, the shaft having a large diameter part and a small diameter part;

a second tapered part connecting the large diameter part and the small diameter part of the stepped shaft;

a thrust ring fit on the stepped shaft, the thrust ring being received into the expanded diameter part on the cylindrical hole;

a first dynamic pressure groove formed on the outer circumferential surface of either the large diameter part of the cylindrical hole or the large diameter part of the stepped shaft;

a second dynamic pressure groove formed on the outer circumferential surface of either the small diameter part of the cylindrical hole or the small diameter part of the stepped shaft;

a third dynamic pressure groove formed on either the first tapered part or the second tapered part;

a fourth dynamic pressure groove formed on either the step part leading to the expanded section of the cylindrical hole or a top surface of the thrust ring; and

lubricating oil filled in small gaps formed between facing surfaces adjacent to the first dynamic pressure groove, the second dynamic pressure groove, the third dynamic pressure groove and the fourth dynamic pressure groove.

30. The hard disk drive of claim 29 further comprising:

a widened section formed in the large diameter part of the cylindrical hole to form a widened seal part.